ABOUT THESE MAPS

Maps a, b and c show the at-sea density (birds/km^2) of Heermann's Gull (*Larus heermanni)* in three ocean seasons – Upwelling, Oceanic, and Davidson Current, displayed in cells of 5' latitude by 5' longitude. Densities are based on the combined data sets of several studies; see the Data and Analyses section of this chapter. The color and mapping intervals were selected to show the most structure and highlight significant areas, while allowing comparisons among marine bird species. Cells that were surveyed but in which no Heermann's Gulls were observed have a density of zero. Areas not surveyed appear white; no information was available for these areas. Blue lines indicate the boundaries of the National Marine Sanctuaries in the study area: Cordell Bank, Gulf of the Farallones and Monterey Bay. Bathymetric contours for the 200 m and 2,000 m isobaths are shown in light blue.

In order to provide an integrated look at the patterns of a species' spatial and temporal occurrence and abundance in the study area, map d shows seasonal high-use areas, displayed in cells of 10' latitude by 10' longitude, and also breeding colonies (when available). The seasonal high use map provides a further synthesis of densities presented in maps a, b and c, and portrays the relative importance of various areas to the species. Areas with consistently high use are highlighted. See the Data and Analyses section of this chapter for further explanation of high-use areas.

DATA SOURCES AND METHODS

The at-sea data set is referred to as the CDAS central California data set (1980-2001) and was developed using software called Marine Mammal and Seabird Computer Data Analysis System (CDAS), by the R.G. Ford Consulting Co. The data set extends from Pt. Arena to Pt. Sal in the study area, and the surveys used were conducted between 1980 and 2001. See the Data and Analyses section of this chapter for more information on the at-sea survey data sets and methods.

RESULTS AND DISCUSSION

Heermann's Gull was the third most abundant gull species in the data set; the surveys in CDAS recorded 828 sightings of 1,790 individuals. Therefore, relative to others, Heermann's Gull was considered a common species. This species is present mostly during the late summer and fall (Upwelling and Oceanic seasons), but it can occur year-round, especially during warm-water years. The species leaves the area starting in late winter (Davidson Current Season) to nest mostly on islands in the Gulf of California. The species is known to occasionally breed in or adjacent to the study area (Acatraz Island, 1979-91; Shell Beach Rocks, 1980; Roberts Lake Seaside, Monterey Co., 1999+; and Ano Nuevo Island, 1994-1996).

The Heermann's Gull is a kleptoparasite of Brown Pelicans. Heermann's Gull is represented in the study area by a large proportion of subadults. Like the pelican, it mostly nests on islands in the northern Gulf of California, at the same time as the pelican. Not surprisingly, its occurrence patterns are very similar to those of the pelican.

The species occurs primarily over the continental shelf, and mostly offshore of river mouths and bays. Based on data from the shipboard surveys in CDAS, the mean distance from land for this gull was 11.1 ± 0.6 km and the mean depth over which it was sighted was 402 ± 41 m. These reported average depths and distances are likely deeper and farther from shore than they actually were because most research vessels approached only to within about 1.5 km of shore and thus the closest-to-shore habitat was under-sampled. A multiple regression analysis of nine independent variables in CDAS explained 6.5% of the variance in density, with the top three variables for this species being: distance to land (closer to land, higher abundance); ENSO period (more abundant during El Niño); and latitude (more abundant in southern part of study area). It is likely that including pelican density as a variable would result in a marked improvement of the variance in density explained by the regression analysis. This species was most concentrated in inner Monterey Bay and other near-coast protected areas, where the abundance of Heerman's Gull increased in the study area between 1985 and 2002.

Heermann's Gulls are generalist feeders, consuming anything edible that it finds at the surface; however this gull mostly feeds on small pelagic fish that it steals from pelicans when the latter are filtering the prey from the water caught in their pouch after a plunge. See Tables 3.5, 3.8, 3.9, and 3.10 and 3.11 for related information.